

NATURAL AND CULTURAL
RESOURCES
MANAGEMENT PROGRAM

MARCH 1982 REVISION

WALNUT CANYON


NATIONAL MONUMENT ● ARIZONA

MANAGEMENT PROGRAM

An Addendum to the
NATURAL AND CULTURAL RESOURCES MANAGEMENT PLAN
for
WALNUT CANYON NATIONAL MONUMENT
ARIZONA

Prepared by
Walnut Canyon National Monument
National Park Service
Department of the Interior

Revision of March 1982



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NATURAL AND CULTURAL RESOURCES MANAGEMENT PROGRAM

OVERVIEW AND NEEDS

The Walnut Canyon National Monument Natural and Cultural Resources Management Plan, Environmental Assessment, and an appended Management Program were completed in February 1976. The Management Program was revised in June 1979. This March 1982 edition represents the second revision of the original Management Program.

This Management Program is a reference document for use in carrying out key identified natural and cultural resources projects in Walnut Canyon National Monument. While the Natural and Cultural Resources Management Plan for Walnut Canyon proposes a long-term action program, this Management Program deals with the next five years only. The Program proposes projects for Fiscal Years 1982 through 1986. As often as needed, generally annually, the Management Program will be revised and updated for a new five-year period as work is completed and new projects are proposed.

The Management Program presented on the subsequent pages of this document consists of:

1. Resources Projects Programming Sheet. This summarizes each project's priority and proposed time schedule for a five-year period. This sheet indicates which projects require additional funds from Western Regional Office to carry them out.
2. New Resources Project Statements: These include both new and revised actions not included in the original management program.

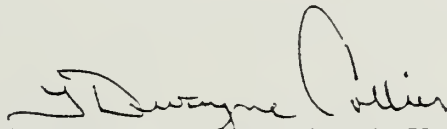
This revision includes the following project statement, rewritten to include a management proposal along with required research to carry out the project: --- Forest Fire History, Ecology, Management Plan, and Implementation (RM-3). Also, a new Project Statement has been added here, Water Resources Management Plan (W-1).

3. Formerly Proposed Resources Project Statements. These projects were included in the original Management Program but haven't yet been carried out and some not yet started. Only cost figures of these projects have been changed, i.e. increased, reflecting higher costs due to inflation.
4. Air Quality General Statement
5. Status of Resources Projects. A summary table of resources management actions underway and proposed.
6. Needs for Assessment of Cultural Resources. This statement reviews steps to be taken to assure proposed development projects will not damage cultural resources.

It was determined through public and National Park Service review of the 1976 Natural and Cultural Resource Management Plan, Environmental Assessment, and the 1979 Management Program Addendum that the proposed actions would not have significant environmental impacts or adversely affect cultural resources. Because the newly proposed projects fall within the "umbrella" of the 1976 Environmental Assessment and Section 106 clearance, no further consultation and/or documentation of impacts is necessary prior to project implementation.

Oct 8, 1981

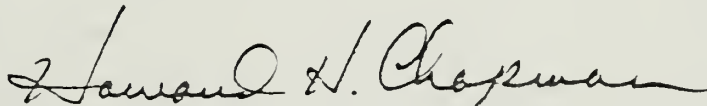
Date



Ranger-in-Charge, Walnut Canyon National Monument

4-5-82

Date



Regional Director, Western Region

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WESTERN Region	AZ State	Date	October 5, 1981									
			NATIONAL PARK SERVICE COSTS IN DOLLARS									
DOCUMENT PRIORITY	PROJECT TITLE	Action Type	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5	
			Base*	New**	Base	New	Base	New	Base	New	Base	New
1	RM-3 Fire History, Ecology, Research Management Plan, and Implementation	Research	0	10,000	0	10,000	0	8,000				
	RM-3 "	Mgmt.	0	9,500								
2	A-1 Archeological Site Survey	Research	0	35,000	0	9,500	0	9,500	0	9,500	0	9,500
3	RM-2 Aerial Photographs	Mgmt.	0	6,500								
4	A-2 Ruins Stabilization	Mgmt.	0	14,000								
5	N-7 Impact of Sinaguan and Post-Sinaguan Man on the Ecosystem	Research			0	13,000	0	13,000				
6	N-9 Annotated Bibliography of Resources	Research			0	14,000						
7	N-3 Visitor Carrying Capacity	Research			0	9,500	0	9,500	0	8,000		
8	N-5 Vertebrate Inventory	Research					0	6,000	0	4,500		
9	N-2 Veget'n-Soil Survey	Research					0	18,000				
10	N-8 Animal Ecology	Research					0	12,000	0	12,000	0	12,000
11	N-4 Forest Insect Disease Inventory & Ecology	Research							0	12,000	0	12,000
12	RM-1 Climatic Air Quality Study	Research							0	5,000		
13	II-1 Hist.Struct.Rehab.	Mgmt.							0	30,000	0	30,000
14	W-1 Water Resources Management Plan	Research							0	4,000	0	2,000

* - Base - Funds available for use in park base.
** - New - Funds unavailable in park and requested from WRO

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region
2. PROJECT NAME AND NUMBER: Forest Fire History, Ecology, Management Plan, and Implementation, WACA RM-3
(formerly Forest Fire History, Ecology, and Management Study, WACA N-6).
3. STATEMENT OF PROBLEM: Man-caused and naturally occurring forest fires have been aggressively suppressed since Walnut Canyon was established as a national monument. These suppression activities have interrupted and influenced the natural role of fire in forest succession and the ecology of the area. The suppression efforts have led to an unnatural and heavy build-up of forest litter.
4. WHAT HAS BEEN DONE: There are minimal and inadequate forest fire records for the monument as a part of fire suppression efforts. The plant/fire ecologist from Western Region has made a preliminary onsite inspection of the situation.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN:

Phase 1: Collect fire history data from USFS for surrounding forest areas. Date fires within the monument from fire-scarred trees and fire records. Gather National Fire Danger Rating System data for a five-year period in order to get a profile of the fire season. Survey and map the heavy concentrations of unnatural fuel litter within the monument. Compare archeological data maps with fuel litter map and fire history data.

Phase 2: Develop fire management plan and implementation procedures including coordination with adjacent ranger districts of the Coconino NF, USFS. Establish a program for prescribed burning to reduce fuels, especially hazardous accumulations that threaten life and property, and to restore fire as an environmental process. Examine areas and conditions where natural fires may be allowed to burn in the Monument. Revise cooperative agreement with USFS for low impact suppression when suppression is necessary and investigate cooperative prescribed fire program for planned and unplanned ignitions. Obtain necessary archeological clearance/compliance for proposed let-burn and prescribed areas.

Phase 3: Implement fire plan and cooperative agreements and begin to monitor results.
6. LENGTH OF TIME NEEDED: Up to five years for phases 1 and 2. If prescribed fire program is agreed upon, phase 3 would then be a recurring program.
7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: The unnatural conditions caused by suppression and the continued increase in fire hazards due to litter buildup will persist. The potential for a holocaust fire will be greater each year if fuels are allowed to accumulate unnaturally.

8. WHAT ARE THE ALTERNATIVES:

- a. Continue suppression activities indefinitely.
- b. Allow limited prescribed burns and complete study leading to reintroduction of natural fire in the ecosystem.
- c. No action; no suppression, protection, or studies.

PERSONNEL: Can be undertaken by park staff personnel with consultation with plant/fire ecologist in WRO and USFS personnel. Western Archeological and Conservation Center staff will perform archeological aspects.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding (Research)</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services	8,500	8,500	7,000		
Other than Personal Services	<u>1,500</u>	<u>1,500</u>	<u>1,000</u>		
Grand Total	10,000	10,000	8,000		
Funds Available in Park Base	<u>0</u>	<u>0</u>	<u>0</u>		
Funds Requested from Regional Office	10,000	10,000	8,000		

<u>Funding (Management)</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services (estimate)	8,000	8,000	8,000	8,000	8,000
Other than Personal Services	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>	<u>1,500</u>
Grand Total	9,500	9,500	9,500	9,500	9,500
Funds Available in Park Base	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Funds Requested from Regional Office	9,500	9,500	9,500	9,500	9,500

On Form Date Submitted
 10-237 October, 1981

11. REFERENCES AND CONTACTS:

Plant/Fire Ecologist, National Park Service, WRO

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
 Revised: October 5, 1981

CULTURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region.
2. PROJECT AND NUMBER: Archeological Site Survey, WACA-A-1.
3. STATEMENT OF PROBLEM: Past surveys of the monument have not systematically covered some localities, and survey records and maps are inconsistent, often unreliable, and incomplete. While there have been some surveys outside the monument to provide interpretive background in areas beyond the arbitrary boundaries of the monument, there is no adequate archeological inventory or base map. There are a number of deficiencies in the interpretive background of the monument which can be corrected through survey.
4. WHAT HAS BEEN DONE: Before the area became a national monument, Dr. Harold S. Colton surveyed the vicinity, primarily within the canyon. More recent surveys have been done on the north rim (Van Valkenburgh) and the south rim (Euler). Euler's survey was done with systematic controls and apparently is comprehensive; Van Valkenburgh's north rim survey was carried out in the winter when the ground was partially snow-covered, and she appears to have been selective in the locations investigated. Later survey has identified check-dams which were apparently ignored earlier. Mapping, when done, has been inaccurate and unreliable.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN:
 - a. Comprehensive analysis of records from previous survey to identify deficiencies.
 - b. Resurvey of the north rim, including terrace dams, and collection of soil for pollen analysis to investigate possible plant cover changes during the Elden phase. Re-record sites on current site survey forms.
 - c. Expand survey of the south rim into canyons described by Euler's report.
 - d. Revisit and re-record sites within the canyon.
 - e. Prepare an archeological base map.

g. Prepare a report dealing with the following topics, at a minimum--seasonal changes in settlement, field locations, check-dam distribution and use, locations of clay deposits used by canyon and rim inhabitants, the relationship between settlement and the sustaining area during the prehistoric occupation of Walnut Canyon, population estimates for all periods of the Canyon's occupation, distribution and interpretation of petrographic art, chronology of ledge ruins--if more research is needed to explore these questions, the survey report should provide specific research proposals to do this.

h. Prepare a draft National Register of Historic Places form for the ~~archeological resources of the Monument.~~

6. LENGTH OF TIME NEEDED: Five months field time, seven months for analysis and report.

7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: Without the proposal an accurate and complete inventory and archeological base map, based on site surveys, will not be available. Without such an inventory and base map the area's cultural resources cannot be properly managed.

8. WHAT ARE THE ALTERNATIVES: No action.

9. PERSONNEL: This project could be accomplished by a contract with an organization such as the Northern Arizona University or the Museum of Northern Arizona. The Western Archeological and Conservation Center can negotiate such a contract.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>		<u>Year in Program Sequence</u>				
		1st	2nd	3rd	4th	5th
Personal Services	35,000					
Other than Personal Services	0					
Grand Total	35,000					
Funds Available in Park Base	0					
Funds Requested from Regional Office	35,000					
<u>On Form</u>		<u>Date Submitted</u>				
10-238		July 31, 1972				

11. REFERENCES AND CONTACTS:

- a. Sam Henderson, Casa Grande Ruins National Monument, AZ
- b. Western Archeological and Conservation Center.
- c. Regional Archeologist Roger Kelly, Western Regional Office

12. DATE OF SUBMISSION: Originally submitted: August 31, 1973.
Revised: October 5, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region.
2. PROJECT NAME AND NUMBER: Aerial Photographs, WACA RM-1
3. STATEMENT OF PROBLEM: Aerial photographs of the monument are a high priority need. They are needed to complete the vegetative and soil maps, and for use in the archeological site survey. Aerial photographs would also expedite many of the other proposed projects and studies.
4. WHAT HAS BEEN DONE: ~~Some old aerial photographs that cover portions of the monument are available.~~
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: Division of Remote Sensing, Southwest Region, Albuquerque, National Park Service (NPS) will be contacted to determine what aerial photographs of the monument are available. Aerial photographs of the entire monument will be acquired. The photos will be in color, suitable for stereo use, and in a scale of 1"-800'. An orthophoto map, a photomosaic adjusted for true scale during printing, will be prepared for the monument.
6. LENGTH OF TIME NEEDED: One day to fly the area and two months processing time.
7. WHAT WILL HAPPEN IF THE PROJECT IS NOT UNDERTAKEN: If aerial photos are not obtained, compilation of a number of the area's resource maps, including vegetative and soil maps will be very difficult. Extra field work would be required on many projects.
8. WHAT ARE THE ALTERNATIVES: No action.
9. PERSONNEL: U.S. Marine Corps or contract personnel. NPS personnel in Denver and Albuquerque.

ADMINISTRATION AND LOGISTICS:

Funding

- a. If obtained through U. S. Marine Corps' Aerial Photography School, there would possibly be no cost, or a minimal cost for processing.
- b. By U. S. Geological Survey or commercial company.

		<u>Year in Program Sequence</u>				
		1st	2nd	3rd	4th	5th
Personal Services (Contract)	3,000					
Other than Personal Services	3,500					
Grand Total	6,500					
Funds Available in Park Base	0					
Funds Requested from Regional Office	6,500					
<u>On Form</u>		<u>Date Submitted</u>				

11. REFERENCES AND CONTACTS:

- a. Brown, Mary Lou
U. S. Geological Survey, Prescott, Arizona.
- b. Remote Sensing Coordinator
Denver Service Center, Denver, Colorado
- c. U. S. Marine Corps Aerial Photography School
Yuma, Arizona.
- d. Dr. Thomas Lyons, Division Chief, Remote Sensing, NPS, SWRO,
Albuquerque.

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974
Revised:

CULTURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region
2. PROJECT AND NUMBER: Ruins Stabilization, WACA-A-2.
3. STATEMENT OF PROBLEM: Walnut Canyon includes approximately 300-400 individual cliff dwelling rooms. Masonry walls were built of unfaced, random limestone; rocks laid double in clay mortar and plastered with clay. Destruction in the more accessible ruins has been due to: (1) vandalism; (2) cattle; and (3) weather. Front walls are not bonded to the partition walls and collapse easily.
4. WHAT HAS BEEN DONE: The objectives of the on-going stabilization program thus far have been to (1) maintain those sites along trails receiving heavy visitor traffic; and (2) to stabilize sites in view from either the visitor center or interpretive trails. Stabilization at the monument is slow, expensive, and arduous because access to the ruins is difficult. The most convenient method, so far, has been the use of an aerial tramway system with its terminal end-positioned near the site to be stabilized. This mechanical method leaves no irreversible scars on the landscape.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN:

Basic maintenance stabilization should include the following:

- a. Inspection of sites and documentation of stabilization needs, including photography of condition.
- b. Minor repairs, as needed, to maintain the ruins in good condition.
- c. Resetting loose stone, grouting and repairing cracks and separations in wall construction.
- d. Controlling rodent populations where their presence and activities present potential damage to the ruins.
- e. Treatment of original or replacement wood in the ruins with a pesticide or preservative.
- f. Where possible, in those ruins where there is no visitation, stabilization repair should be made with an adobe mortar to maintain an original texture and appearance. In sites that have heavy visitation, repairs may be made with a tinted cement to achieve the strength needed to withstand visitor impact.

Priority of stabilization work

Sites NA7 739-NA743--heavy visitation of these sites on the Island Trail demands that they be scheduled for major maintenance stabilization every 5-10 years and be inspected annually to forestall any potential problems before they endanger the site or visitors. Their last stabilization was in 1973.

Sites NA 103 and NA 476--heavy visitation of these sites in connection with the park's interpretive program requires that they be submitted to annual inspection and cyclical maintenance every 5-10 years.

Sites NA 331-NA 338--these sites are directly visible from the visitor center. They are not subject to visitor traffic, however, so their stabilization is less urgent but still advised. Annual or bi-annual inspection is recommended with cyclical maintenance (5-10 years). Excavation could be scheduled with stabilization in the future.

Sites NA 317-NA 326-NA 330; NA 748--these sites are not on an open trail currently, but the trail may become part of the interpretive system in the future. They are visible from the Island Trail and the visitor center. NA 317, NA 318, and NA 324 are almost totally destroyed. 5-10-year cyclical maintenance with annual inspection is recommended unless the sites do become part of a new interpretive trail, in which case a more intensive stabilization program should be instituted.

Sites NA 396, NA 397, NA 398, NA 400, NA 401, NA 747--visible from the Island Trail, these sites should be inspected annually and receive 5-10-year cyclical stabilization.

Sites NA 745, NA 746, NA 394, NA 395--visible from the North Rim Overlook and the Island Trail. NA 746 is rare in that it is one of the few two-room deep structures in the canyon. These sites are highly inaccessible to maintenance stabilization but should be included in a 5-10-year cyclical program, regardless.

Sites NA 300-NA 313--only partly visible with no visitation. Should be a stabilization program for them as soon as possible. Their low visitor use mitigates against their priority for preservation, but they are important to an interpretive program and should be stabilized. It is important that there be an inspection here prior to stabilization in order to maintain and preserve as much of the original material as possible.

6. LENGTH OF TIME NEEDED: This is an ongoing project. Major stabilization time requirements will depend on available funding and size of crew.

7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Failure to keep up cyclical maintenance may result in irreversible loss of the very cultural resources that Walnut Canyon National Monument was created to preserve.

8. WHAT ARE THE ALTERNATIVES: No action.

9. WHO WILL ACCOMPLISH THE PROJECT: Inspection and basic maintenance is the responsibility of the area. Major stabilization can be done by Western Archeological and Conservation Center, or they can negotiate a contract with a suitable institution.

10. ADMINISTRATION AND LOGISTICS: Existing reports prepared by the Ruins Stabilization Office should serve as adequate guidelines for any maintenance stabilization projects.

<u>Funding</u>	<u>1st</u>	<u>Year in Program Sequence</u>				<u>5th</u>
		<u>2nd</u>	<u>3rd</u>	<u>4th</u>		
Personal Services	14,000					
Other than Personal Services	0					
Grand Total	14,000					
Funds Available in Park Base	0					
Funds Requested from Regional Office	14,000					

On Form

Date Submitted

11. MANAGEMENT AND EVALUATION STATUS:

	<u>Required</u>	<u>Done</u>
a. Assessment of effect on Cultural Resources Form	x	
b. Environmental Review of Stabilization	x	
c. Stabilization Report	x	

12. REFERENCES AND CONTACTS:

a. Walnut Canyon National Monument

b. Southern Arizona Group _____

c. Western Archeological/Conservation Center

13. DATE OF SUBMISSION: Originally submitted June 30, 1974.
Revised: October 5, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region.
2. PROJECT NAME AND NUMBER: The Impact of Sinaguan and Post-Sinaguan Man on the Ecosystem, WACA N-7.
3. STATEMENT OF PROBLEM: No ethno-biological studies have been undertaken at Walnut Canyon National Monument. The Sinaguan impact on the area's ecosystem is merely speculation. White man's impact on the area is only partly known, i.e., there were cattle grazed to a minor extent, and sheep grazing to a major extent in the early 1900s. Just how much this practice set back or changed the ecological successional processes is unknown. The Sinaguan influences on the environment are valid because of the area's historical/archeological designation. White man's impact is invalid and should be corrected where possible.
4. WHAT HAS BEEN DONE: The impact of historic times has been recorded in various ways and in various locations throughout the years. Walnut Canyon has a fact file which has attempted to accumulate some of this information. Interviews with pioneer residents have been taped and transcribed.
5. DESCRIPTION OF WORK TO BE UNDERTAKEN:
 - a. Ethno-biological studies to determine the extent of Sinaguan impact on the environment during the period of occupation.
 - b. Library research for references to historic uses and impacts on Walnut Canyon.
 - c. Personal interviews with old-time residents of Flagstaff area to obtain information about the pioneer days of the area.
 - d. Study the local ecology of the various forest types within Walnut Canyon and other vegetative communities.
 - e. Study the impact of developed facilities within the area, since under government control and administration.
 - f. Identify cultural elements and patterns of human use.
 - g. Recommend actions to correct or minimize any cumulative impacts.
6. LENGTH OF TIME NEEDED: Two to three years.

7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: One of the primary Natural Resources Management Objectives for Walnut Canyon is ". . . minimize, or control those changes in the native environment resulting from historic man's (non-Sinaguan) influences on the natural processes of ecological succession. Native environmental complexes will be protected and managed. . . at levels determined through archeological and ecological research. . . to be appropriate." This primary management objective cannot be approached or obtained without the knowledge and information to be obtained by this proposed project.

8. WHAT ARE THE ALTERNATIVES:

- a. No action.
- b. Approach the sub-projects as separate projects.

9. PERSONNEL: A combination of Archeological and Conservation Center and Walnut Canyon personnel, contracted research personnel, and regional professional personnel.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services (estimate)		10,000	10,000		
Other than Personal Services		3,000	3,000		
Grand Total		13,000	13,000		
Funds Available in Park Base		0	0		
Funds Requested from Regional Office		13,000	13,000		
<u>On Form</u>	<u>Date Submitted</u>				

11. REFERENCES AND CONTACTS:

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
Revised: October 5, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region
2. PROJECT NAME AND NUMBER: Annotated Bibliography of Natural Resources: Literature/information search and compilation, WACA N-9.
3. STATEMENT OF PROBLEM: Various studies have been made and reports written on various resources of the monument. This information needs to be brought into a working document for park staff to use in better management of monument resources.
4. WHAT HAS BEEN DONE: Various studies have been made and reports and documents are available in the monument library. Also information about Walnut Canyon National Monument is available at the Museum of Northern Arizona, Northern Arizona University, and the Smithsonian Institution.
5. DESCRIPTION OF WORK TO BE UNDERTAKEN: An annotated bibliography covering the key natural resources in the monument. This comprehensive report should not only summarize available information on key resources but also provide recommendations and future direction for managing the area's resources.
6. LENGTH OF TIME NEEDED: One year.
7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: Management will not have the benefit of past research on which to base decisions, and needless duplication of research may be carried out.
8. WHAT ARE THE ALTERNATIVES: No action.
9. PERSONNEL: Research personnel.
10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services		14,000			
Other than Personal Services		0			
Grand Total		14,000			
Funds Available in Park Base		0			
Funds Requested from Regional Office		14,000			

On Form

Date Submitted

11. REFERENCES AND CONTACTS:

Warren Steenbergh

12. DATE OF SUBMISSION: New Project Statement, absent from original
Management Program.
Prepared October 5, 1981

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region
2. PROJECT NAME AND NUMBER: Visitor Carrying Capacity, WACA N-3.
3. STATEMENT OF THE PROBLEM: At present there are four areas open to visitor use: the Visitor Center, the Rim Trail, the Island Trail and the Picnic Area. The capacity for visitor use of these areas has not been determined. The capacity for visitor use (if one exists) for unopened areas such as the canyon bottom, the old headquarters cabin, and potential interpretive trail sites has not been determined. If present open areas become overused, the visitor carrying capacity of other areas must be known before they are opened to the public.
4. WHAT HAS BEEN DONE: Visitor use is now restricted to certain limited developed areas: the Visitor Center, the Rim Trail, the Island Trail, and the Picnic Areas. No study of visitor impact on these areas or on presently closed areas with high interpretive value has been made.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: There will be several sub-projects emphasized:
 - a. Rotating use in current open areas to provide baseline data for impacts of light and heavy visitation.
 - b. Evaluating the influence of various management techniques (ex., to pave or not to pave) on carrying capacity.
 - c. Establishing maximum allowable visitation levels in current use areas and evaluating present use in that context.
 - d. Investigating current closed areas with high interpretive values and establishing potential visitor use levels for those areas.
6. LENGTH OF TIME NEEDED: Three years.
7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: In the future, as at present, the level of visitor use will not be able to be compared to maximum allowable limits, since no limits will be known. The areas presently in use may become too heavily used in the future and degradation of the resources may occur. The impact of opening new areas for interpretation or other uses will not be known in advance.

8. WHAT ARE THE ALTERNATIVES:

- a. No action.
- b. Do not conduct study and impose arbitrary visitor limitations.

9. PERSONNEL: This study should be contracted with personnel from a local institution.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services (Contract)		8,000	8,000	8,000	
Other than Personal Services		1,500	1,500	0	
Grand Total		9,500	9,500	8,000	
Funds Available in Park Base		0	0	0	
Funds Requested from Regional Office		9,500	9,500	8,000	

On Form

Date Submitted

11. REFERENCES AND CONTACTS:

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
Revised: October 5, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region
2. PROJECT NAME AND NUMBER: Vertebrate Inventory, WACA N-5.
3. STATEMENT OF PROBLEM: The monument staff lacks sufficient knowledge of the area's vertebrate fauna to adequately manage and interpret the resource.
4. WHAT HAS BEEN DONE: Current checklists of the mammals and birds have been prepared. An incomplete reptile list has also been prepared. No such lists have been prepared for the amphibians. Inadequate and often unreliable records of sightings have been kept since 1936.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: A general survey of the monument's vertebrates will be conducted. Checklists will be developed for the monument's birds, reptiles, and amphibians. Habitat associations and the seasonal nature of occurrence will be noted for all species. Rare, unique, and threatened species will be identified. As problems are identified, research proposals will be developed to deal with these.
6. LENGTH OF TIME NEEDED: Two years.
7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: The monument staff will continue to manage the resource without adequate knowledge.
8. WHAT ARE THE ALTERNATIVES:
 - a. Do nothing.
 - b. Develop checklist only.
9. PERSONNEL: From local research institution.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services (Contract)			4,500	4,500	
Other than Personal Services			1,500	0	
			<hr/>	<hr/>	
Grand Total			6,000	4,500	
Funds Available in Park Base			0	0	
			<hr/>	<hr/>	
Funds Requested from Regional Office			6,000	4,500	
<u>On Form</u>	<u>Date Submitted</u>				

11. REFERENCES AND CONTACTS:

- a. Salomonson, Michael G.
1973. Checklist of mammals of Walnut Canyon National Monument. Plateau 46 (1).
- b. U.S. Forest Service, Wildlife Biologist
- c. Northern Arizona University, Wildlife School

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
Revised: October 5, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region.
2. PROJECT NAME AND NUMBER: Vegetation and Soil Survey, WACA N-2
3. STATEMENT OF THE PROBLEM: Management and interpretation of the area's vegetation and soils have been hampered by a lack of information on these resources.
4. WHAT HAS BEEN DONE: A plant species list has been prepared for the monument.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: After aerial photographs of the area are obtained, vegetation and soil units will be delineated on the photographs. Ground surveys will determine composition, density, and homogeneity of the vegetative units. Successional relationships between the units will be determined. Any unique or threatened plant species and/or communities will be identified. The accompanying soil survey will identify soil series and types, provide for each series a profile description, and discuss physical and chemical properties in relation to plant growth. Soil and vegetation maps will be prepared.
6. LENGTH OF TIME NEEDED: One year.
7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: Management will continue to manage the area without adequate knowledge of the vegetation and soil resources.
8. WHAT ARE THE ALTERNATIVES: No action.
9. PERSONNEL: This study could best be accomplished by contract with ecologists through Cooperative Park Studies Unit at University of Arizona.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services (Contract)			14,000		
Other than Personal Services			4,000		
Grand Total			18,000		
Funds Available in Park Base			0		
Funds Requested from Regional Office			18,000		
<u>On Form</u>	<u>Date Submitted</u>				

11. REFERENCES AND CONTACTS:

a. Haldeman, John and A. B. Clark.
1969. Walnut Canyon: an example of relationships
between birds and plant communities. Plateau
41 (4).

b. U.S. Forest Service, Wildlife Biologist

c. Northern Arizona University, Botany School

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
Revised: October 5, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region.
2. PROJECT NAME AND NUMBER: Animal Ecology, WACA N-8.
3. STATEMENT OF THE PROBLEM: The monument staff recognizes that many problems exist in this area but has yet to identify species. Some large predators exist in the area but we have no knowledge of how to provide for their preservation. The elimination of flow in Walnut Creek many years ago may have had adverse effects on resident wildlife populations. Outside influences on the monument's wildlife are unknown.
4. WHAT HAS BEEN DONE: No research has been conducted.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: This project proposes to carry out research in problem areas identified in the Vertebrate Inventory (N-5). The park envisions research on such problems as predator management, water and wildlife, effects of factors external to the park on resident wildlife, etc.
6. LENGTH OF TIME NEEDED: Three years for the first of a series of studies to follow.
7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: The monument will have identified areas where research is necessary for efficient management but the research will not be accomplished.
8. WHAT ARE THE ALTERNATIVES: No action; do not use information acquired in vertebrate inventory.
9. PERSONNEL: Local research institution.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services			12,000	12,000	12,000
Other than Personal Services			0	0	0
Grand Total			12,000	12,000	12,000
Funds Available in Park Base			0	0	0
Funds Requested from Regional Office			12,000	12,000	12,000

On Form

Date Submitted

11. REFERENCES AND CONTACTS:

a. U.S. Forest Service, Wildlife Biologist

b. Northern Arizona University, Wildlife School

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
Revised: October 5, 1981. .

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region.
2. PROJECT NAME AND NUMBER: Forest Insect and Disease Inventory and Ecology, WACA N-4.
3. STATEMENT OF PROBLEM: The monument's forest insects and disease organisms have been only partially inventoried. Current gaps in our knowledge of these resources precludes their proper interpretation and establishment of an effective management program.
4. WHAT HAS BEEN DONE: An unauthenticated and incomplete insect collection has been compiled. The USFS has identified Douglas-fir beetles and done some control work in the area.
5. DESCRIPTION OF WORK TO BE UNDERTAKEN: The identification of all specimens in the current insect collection will be checked. New specimens will be added to the collection and efforts will be made to identify the majority of the area's insect species. Special attention will be given to the identification of those species which adversely affect the area's trees. Problem areas requiring further research will be identified and appropriate studies will be proposed.

Forest diseases in the area will be identified, along with the magnitude of the infection. Recommendations for the management of both forest insects and pests and diseases will be sought.

6. LENGTH OF TIME NEEDED: Two years.
7. WHAT WILL HAPPEN IF NOT UNDERTAKEN: The monitoring of forest insect pests and diseases will only be reactionary and when their impacts are readily apparent to park staff. Interpretation would lack complete data for answering visitor questions and for interpretive talks and walks.
8. WHAT ARE THE ALTERNATIVES:
 - a. No action.
 - b. Initiate control work without any studies.
9. PERSONNEL: Contracted, research personnel.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	Year in Program Sequence				
	1st	2nd	3rd	4th	5th
Personal Services (Contract)				9,000	9,000
Other than Personal Services				3,000	3,000
Grand Total				<u>12,000</u>	<u>12,000</u>
Funds Available in Park Base				<u>0</u>	<u>0</u>
Funds Requested from Regional Office				<u>12,000</u>	<u>12,000</u>
<u>On Form</u>	<u>Date Submitted</u>				

11. REFERENCES AND CONTACTS:

a. U. S. Forest Service

b. Northern Arizona University Forestry School

c. CPSU scientist, University of Arizona

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
Revised: October 5, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region.
2. PROJECT NAME AND NUMBER: Climatic and Air Quality Data, WACA RM-2
3. STATEMENT OF PROBLEM: Only limited climatological data is collected at the area's weather station. More complete data is needed to properly assess resource status, trends, and interrelationships in the area. In the absence of air quality monitoring within the monument, maintaining acceptable air quality depends on the utilization of air quality data obtained outside the monument. The effective use of such data requires more complete meteorological information than is presently available in the monument.
4. WHAT HAS BEEN DONE: Weather data is collected daily at 5:00 p.m. Such data has been collected since 1966. Precipitation and minimum, maximum, and at observation temperatures are recorded.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: Additional weather instruments will be obtained. In addition to the data currently collected, relative humidity, wind speed and direction, and fuel stick moisture will be read daily. The reading time may be changed to 1:00 p.m. Air quality data will be collected.
6. LENGTH OF TIME NEEDED: Continuing
7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Incomplete data will continue to be obtained.
8. WHAT ARE THE ALTERNATIVES: No action. Adequate climatological data will not be available for the area.
9. PERSONNEL: Park staff.

10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services					0
Other than Personal Services					5,000
Grand Total					<u>5,000</u>
Funds Available in Park Base					<u>0</u>
Funds Requested from Regional Office					5,000
<u>On Form</u>	<u>Date Submitted</u>				

11. REFERENCES AND CONTACTS:

a. U. S. Weather Bureau, Coconino County Air Pollution Control District.

12. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
Revised: October 5, 1981.

CULTURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region.
2. PROJECT NAME AND NUMBER: Historic Structures Stabilization, Old Headquarters, WACA H-1.
3. STATEMENT OF PROBLEM: The Old Headquarters is in very bad condition and is in need of exterior stabilization to preserve it as an historic resource.
4. WHAT HAS BEEN DONE: The structure has received no stabilization or maintenance beyond reshingling the roof since construction.
5. DESCRIPTION OF THE WORK TO BE UNDERTAKEN: It is not necessary to restore the interior of the cabin, but the exterior needs stabilization. To this end any stabilization work that is necessary will be performed: the construction of a masonry or concrete foundation to support existing walls, chinking and grouting, if needed, chemical preservation treatments where necessary, etc. All work will conform to the specifications and guidelines established in the Historic Structures Report which is required prior to any construction work. Effects of such rehabilitation on the cultural fill around the structure will be evaluated, and if excavation is required it will be conducted to a professionally adequate research design.
6. LENGTH OF TIME NEEDED: Two years.
7. WHAT WILL HAPPEN IF PROJECT IS NOT UNDERTAKEN: The historic resource, on the National Register of Historic Places, would continue to deteriorate until totally lost. Failure to provide the necessary protection would be failing to fulfill the existing requirements of federal legislation regarding such historic resources. No adaptive restored uses possible.
8. WHAT ARE THE ALTERNATIVES:
 - a. No action.
 - b. Perform "holding-action" preservation.
 - c. Not only exterior, but also interior, rehabilitation of the structure.
9. WHO WILL ACCOMPLISH THE PROJECT: Division of Park Historic Preservation, WRO, or Denver Service Center, or the Division of Cultural Properties Conservation, Western Archeological and Conservation Center, or a combination.

ADMINISTRATION AND LOGISTICS OF THE PROJECT:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	1st	2nd	3rd	4th	5th
Personal Services				30,000	30,000
Other than Personal Services				0	0
Grand Total				30,000	30,000
Funds Available in Park Base				0	0
Funds requested from Regional Office				30,000	30,000

<u>On Form</u>	<u>Date Submitted</u>
10-238 Package #107	Aug. 1972

MANAGEMENT AND EVALUATION STATUS:

	<u>Required</u>	<u>Done</u>
a. List of Classified Structures	x	x
b. Nomination to National Register of Historic Places	x	x
Section 106 Report	x	
c. Historic Structures Report	x	

REFERENCES AND CONTACTS:

- a. Western Archeological and Conservation Center (including research in Faraway Ranch document collection for Neill Erickson information on his occupancy of cabin).
- b. Regional Historian Gordon Chappell, WRO

3. DATE OF SUBMISSION: Originally submitted: June 30, 1974.
Revised: October 5, 1981.

NATURAL RESOURCES PROJECT STATEMENT

1. PARK AND REGION: Walnut Canyon National Monument, Western Region
2. PROJECT NAME AND NUMBER: Water Resources Management Plan, WACA W-1
3. STATEMENT OF PROBLEM: In compliance with Public Law 92-500, (Federal Water Pollution Control Act) and as amended by Public Law 95-217 (Clean Water Act of 1977) and as furthered by the Service Memorandum of Understanding with Environmental Protection Agency (EPA), each area must develop a Park Water Plan.
4. WHAT HAS BEEN DONE: No comprehensive water quality management plan has been developed for the area. The normal flow regime of Walnut Creek is disrupted by the two dams which form Upper and Lower Lake Mary. These structures are upstream of the park only a few miles; they account for the fact that the creek seldom flows. However, little is known about the quality of the creek's water during times of flow through park lands.
5. DESCRIPTION OF WORK TO BE UNDERTAKEN:
 - a. An historical report on management of water resources in the park.
 - b. Classification of all surface waters by present and proposed uses.
 - c. An analysis of the present status of park waters, including:
 - (1) Identification of water quality required to support specified uses and, where appropriate, to comply with or assist in establishing State water quality standards.
 - (2) Relationship of water quality to any threatened, known, rare or endangered species indigenous to the park and the relationship of water quality to the protection of all natural resources.
 - (3) A bibliography of available information concerning the existing quality of park waters.
 - d. A description of proposed actions relating to management of park waters.
 - e. A detailed plan for monitoring the quality of park waters that will reveal existing water quality and significant trends.

Future coordination/cooperation with EPA and the State is required to ascertain established water standards.

6. LENGTH OF TIME NEEDED: Three years in which there is stream flow.
7. WHAT WILL HAPPEN IF PROJECT NOT UNDERTAKEN: Service noncompliance with the above Federal Laws.
8. WHAT ARE THE ALTERNATIVES: None.
9. PERSONNEL: Assistance from WRO, Water Resources Division with contracted U.S. Geological Survey to develop/initiate basic aspects. After which, future monitoring will be done by area staff.
10. ADMINISTRATION AND LOGISTICS:

<u>Funding</u>	<u>Year in Program Sequence</u>				
	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>
Personal Services (non-NPS)				2000	1000
Other than personal services				2000	1000
Grand Total				4000	2000
Funds available in park base				Ø	Ø
Funds requested from Regional Office				4000	2000

On Form: 10-238 Date Submitted: To be submitted

11. REFERENCES AND CONTACTS: Division of Water Resources, WRO
12. DATE OF SUBMISSION: October 1981

AIR QUALITY GENERAL STATEMENT

As an addendum to the WALNUT CANYON NATIONAL MONUMENT RESOURCES MANAGEMENT PLAN

Walnut Canyon is in an air quality "attainment" area, which means that the air quality exceeds that required by the National Ambient Air Quality Standards. For purposes of preventing significant deterioration of the existing air quality, the monument and vicinity is designated a class II area wherein prescribed limits on maximum allowable increases of SO₂ and particulate matter would accomodate only well-managed industrial growth. The Clean Air Act Amendments provide maximum protection from air quality deterioration to selected areas of national significance (class I areas), and call for the identification of additional areas having nationally significant air quality related values (potential class I areas). Studies to identify additional areas included a review of Walnut Canyon. That review did not identify air quality related values of sufficient importance to require protection beyond that afforded the surrounding area in order to realize the purpose for which the area was set aside.

STATUS LIST OF NATURAL AND CULTURAL RESOURCES
PROJECTS AT WALNUT CANYON

The following list summarizes on-going resources management and research projects at Walnut Canyon:

ON-GOING CULTURAL RESOURCES MANAGEMENT PROJECTS

Ruins stabilization evaluation done and no major stabilization planned for next five years. Annual maintenance is accomplished with maintenance staff on-site.

ON-GOING NATURAL RESOURCES MANAGEMENT PROJECTS

(RM-3) Preliminary on-site evaluation done by regional plant/fire ecologist in September 1981. Prescribed fire workshop attended by Ranger-in-Charge in September 1981. Regional plant/fire ecologist plans preliminary data collecting trip for 2-3 weeks in spring 1982.

